Paper No. 19

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CHARLES J. STOUFFER
and
DAVID BUGBY

Appeal No. 2003-0057
Application 09/434,507

HEARD: OCTOBER 8, 2003

Before KIMLIN, PAK, and OWENS, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

REMAND

This appeal is from the final rejection of claims 1 and 3-20, which are all of the claims remaining in the application. The claims stand rejected as follows: claims 1, 3-14, 19 and 21 under 35 U.S.C. § 103 as obvious over Gieser,[1] and claims 15-18

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[1] U.S. 2,941,064 to Gieser, Jr. et al., issued Jun. 14, 1960.

and 20 under 35 U.S.C. § 102(b) as clearly anticipated by Gieser. We remand the application because the record has not been developed sufficiently for a decision on appeal.

Gieser discloses a method for welding an aluminum-lined steel flange (14) to an aluminum-lined steel tank outer shell (7) such that the flange and the shell are welded together to form a steel tank and the aluminum liners are fused together to form a separate sealed tank within the steel tank (col. 1, line 71 - col. 2, line 2; col. 2, lines 3-11 and 34-49). The welding of the steel and the fusion of the aluminum liners are effected by opposed welding wheels, one of which (21) is wider than the other (22), which revolve around the periphery of the tank upon their own axes and are pressed toward each other (col. 2, line 71 - col. 3, line 9; col. 3, lines 12-16; col. 4, lines 15-21). The heat needed for the welding and fusion is provided by electric current which is impressed upon the wheels and traverses the flange and shell (col. 3, lines 9-12). In the high-temperature, high-pressure area where the narrower wheel opposes the wider wheel, the temperature is sufficiently high to blast the aluminum out of the area and form a weld between the flange and shell, whereas in the adjacent area where the wider wheel is not opposed by the narrower wheel, the temperature and pressure are lower

such that the aluminum is not blasted out of area but, rather, is melted so as to fuse the aluminum liners together (col. 3, lines 29-75; col. 4, lines 32-37).

The appellants' claims all require a diffusion bond between flanges. The appellants define "diffusion bonding" as "a bonding process by which two work pieces (each formed of the same metal) are joined to one another without using a filler metal and without either of the work pieces melting" (specification, page 4, lines 18-20). The appellants argue that "[w]elding joins two or more metal members by melting them together. Diffusion bonding does not melt the metal parts together" (reply brief, page 2).

"Welding" is "[j]oining two metals by applying heat to melt and fuse them, with or without filler metal", whereas "diffusion bonding" is "[a] solid-state process for joining metals by using only heat and pressure to achieve atomic bonding."[2] However, "[d]iffusion-bonding is sometimes referred to as diffusion-welding, or as 'sintering'",[3,4] and Gieser teaches that "[t]he

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[2] *See McGraw-Hill Dictionary of Scientific and Technical Terms* 570, 2161 (Sybil P. Parker ed., McGraw-Hill 1994), a copy of which is provided to the appellants with this remand.

[3] *See* http://www.mkicorp.com/About%20Us/ Diffusion.htm?

(continued...)

welding temperature for the steel members is in the order of 2000 degrees Fahrenheit" (col. 3, lines 20-21), which is below the melting point of steel.[5] Thus, this disclosure indicates that Gieser's welding is not the type referred to by the appellants which involves melting but, rather, is diffusion welding, i.e., diffusion bonding.

However, as argued by the appellants (brief, page 14; reply brief, page 3) and as indicated by the appellants' specification (page 10, line 23), diffusion bonding requires a processing time

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[3](...continued)
Applications/Chemical/Nutsche.htm, a copy of which is provided to the appellants with this remand.

[4] See also the following disclosure in 19 *McGraw-Hill Encyclopedia of Science & Technology* 436 (McGraw-Hill, 7th ed. 1992), a copy of which is provided to the appellants with this remand:

"**Nonfusion process.** In these processes, the surfaces to be welded coalesce in the solid state under the influence of pressure with or without heat.

* * *

In diffusion welding, intimately fitting faying surfaces of the parts to be joined are held in contact until bond occurs. Pressure and heat are usually used to speed bonding, and very little, if any, deformation occurs. Major applications have been concentrated in fabrication of aircraft and gas turbine parts."

[5] *See Chemical Engineers' Handbook* **23**-38-39, **23**-56 (Robert H. Perry and Cecil H. Chilton eds., McGraw-Hill, 5th ed. 1973), a copy of which is provided to the appellants with this remand.

of several hours.[6] Gieser, however, teaches that the heat and pressure required for the welding is provided by welding wheels which revolve around the periphery of the tank upon their own axes (col. 3, lines 5-19). Gieser does not indicate how the revolving welding wheels can provide, at each point bonded, the several hours of heat and pressure needed for diffusion bonding.

Thus, Gieser appears to provide inconsistent disclosures regarding whether his welding is melt welding or diffusion welding, i.e., diffusion bonding. This apparent inconsistency has not been addressed by the examiner and the appellants, and must be addressed before the record will be developed sufficiently for a decision on appeal. Accordingly, we remand the application for the examiner and the appellants to address on the record whether Gieser's above-discussed disclosures indicate that Gieser's welding is melt welding or diffusion welding.

We also remand the application for the examiner to search the diffusion bonding art, particularly class 228, subclass 193,[7]

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[6] *See* 16 *Kirk-Othmer Encyclopedia of Chemical Technology* 396 (John Wiley & Sons, 4th ed. 1995), a copy of which is provided to the appellants with this remand.

[7] Evidence of the relevance of class 228, subclass 193 is commonly-assigned U.S. 6,264,095, filed July 14, 1999, having its original classification in that subclass. U.S. 6,264,095 has a different inventive entity than the present application. The

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and to consider making a rejection over any relevant additional prior art.

REMANDED

EDWARD C. KIMLIN)
Administrative Patent Judge)
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CHUNG K. PAK) BOARD OF PATENT
Administrative Patent Judge) APPEALS AND
) INTERFERENCES
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TERRY J. OWENS)
Administrative Patent Judge)

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[7](...continued)
examiner should consider a rejection under 35 U.S.C. § 102(e)/103 over this reference alone or, under § 103, in combination with other prior art.

Appeal No. 2003-0057
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